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**Honors Stoichiometry Practice Quiz**

1. The fermentation of glucose (C6H12O6) produces ethyl alcohol (C2H5OH) and CO2:

C6H12O6*(aq)* 🡪 2 C2H5OH*(aq)* + 2 CO2*(g)*

* 1. How many moles of CO2 are produced when 0.4 moles of glucose react?
  2. How many grams of CO2 form when 7.5 grams of ethyl alcohol are produced?

1. Car airbags inflate when sodium azide, NaN3, rapidly decomposes to its component elements:

\_\_\_\_\_\_NaN3*(s)* 🡪 \_\_\_\_\_\_Na*(s)* + \_\_\_\_\_\_N2*(g)*

* 1. How many moles of N2 are produced by the decomposition of 1.5 moles of NaN3?
  2. How many grams of NaN3 are required to form 10 grams of N2?

1. Aspirin (C9H8O4) is produced from salicylic acid (C7H6O3) and acetic anhydride (C4H6O3):

C7H6O3 + C4H6O3 🡪 C9H8O4 + HC2H3O2

* 1. What is the theoretical yield in moles of aspirin if 18.5 moles of salicylic acid reacts with 12.5 moles of acetic anhydride?
  2. If the situation described above produces 2000 grams of aspirin, what is the percent yield?

1. The fizz produced when an Alka-Seltzer tablet is dissolved in water is due to the reaction between sodium bicarbonate (NaHCO3) and citric acid (H3C6H5O7):

3 NaHCO3*(aq)* + H3C6H5O7*(aq)* 🡪 3 CO2*(g)* + 3 H2O*(l)* + Na3C6H5O7*(aq)*

In a certain experiment, 1.00 gram of sodium bicarbonate and 1.00 gram of citric acid are allowed to react.

* 1. What is the limiting reagent?
  2. How many grams of carbon dioxide form?
  3. How many grams of the excess reagent remain after the limiting reactant is completely consumed?

1. Hydrogen sulfide is an impurity in natural gas that must be removed. One common removal method is called the Claus process which relies on this reaction:

\_\_\_\_H2S*(g)* + \_\_\_\_O2*(g)* 🡪 \_\_\_\_S8*(l)* + \_\_\_\_H2O*(g)*

Under optimal conditions, the Claus process results in a 98% yield of S8 from H2S. If you started with 30.0 grams of H2S and 50 grams of O2, how many grams of S8 would be produced, assuming 98% yield?